United States Patent [19]

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[11] **4,417,294**

[45] **Nov. 22, 1983**

[54] **CAPACITIVE KEYSWITCH**

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[21] Appl. No.: **297,439**

[22] Filed: **Aug. 28, 1981**

[51] **Int. Cl.**[3] **H01G 5/01**; H01H 3/12

[52] **U.S. Cl.** ..... **361/288**; 200/159 B

[58] **Field of Search** ..... 361/288, 283; 400/479.1; 200/159 B, DIG. 1; 340/365 C

[56] **References Cited**

U.S. PATENT DOCUMENTS

3,133,170	5/1964	Nanninga	200/67
3,293,640	12/1966	Calfin et al.	345/365
3,308,253	3/1967	Krakinowski	200/159 B
3,584,162	6/1971	Krakinowski	200/159 B
3,676,607	7/1972	Nash	340/365 C
3,693,059	9/1972	Harris	317/249 R
3,702,284	11/1972	Hans-Hermann	204/15
3,710,209	1/1973	Webb et al.	317/249 R
3,751,612	8/1973	Hansen	200/52 R
3,797,630	3/1974	Zilkha	361/288
3,862,381	1/1975	Glaister et al.	200/5 A
3,862,382	1/1975	Glaister et al.	200/5 A
3,950,627	4/1976	Murata et al.	200/159 R
3,951,250	4/1976	Pointen et al.	197/98
3,968,488	7/1976	Bovio	361/288 X
3,973,091	8/1976	Kaminski	200/5 A
3,995,126	11/1976	Larson	200/5 A
3,996,429	12/1976	Chu et al.	200/5 A
4,005,293	1/1977	Boulanger	200/5 A
4,056,700	11/1977	Stannek	200/159
4,066,854	1/1978	Zenk et al.	200/5 A
4,066,855	1/1978	Zenk	200/5 A
4,207,448	6/1980	Furusawa et al.	200/159 B
4,237,351	12/1980	Boulanger et al.	200/5 A
4,245,138	1/1981	Harper	200/5 A
4,254,309	3/1981	Johnson	200/5 A
4,264,477	4/1981	Seeger et al.	252/503
4,287,553	9/1981	Braunlich	361/283
4,288,786	9/1981	Ledniczki et al.	340/365
4,288,836	9/1981	Thornburg	361/288

OTHER PUBLICATIONS

Sheldahl Flexswitch ® Product Bulletins 579 & 1180.
Bowmar Instrument Corporation Brochure 12 and 16 Station Standard Keyboards and 20 and 25 Station Universal Keyboards.

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[57] **ABSTRACT**

A capacitive keyswitch comprising a first circuit support, an electrically insulating spacer, a dielectric structure, a second circuit support and an actuating assembly for actuating the keyswitch; the first circuit support is flexible and carries thereupon a first conductive circuit, the first conductive circuit includes a first conductive land; the second circuit support carries thereupon a second conductive circuit, the second conductive circuit including a second conductive land; the spacer has an aperture therethrough; the first conductive land, the second conductive land, and the aperture are substantially in register with the first conductive land and the second conductive land being in facing relation with respect to each other; the dielectric structure is interposed between the first and second conductive lands; the actuating assembly comprises a plunger and a pad; the pad is interposed between the plunger and the first circuit support whereby application of a force urging the plunger toward the first circuit support urges the pad against the first circuit support and, through the pad, urges the first circuit support toward the second circuit support, whereby capacitance between the first conductive land and the second conductive land is varied as the force is varied.

3 Claims, 2 Drawing Figures